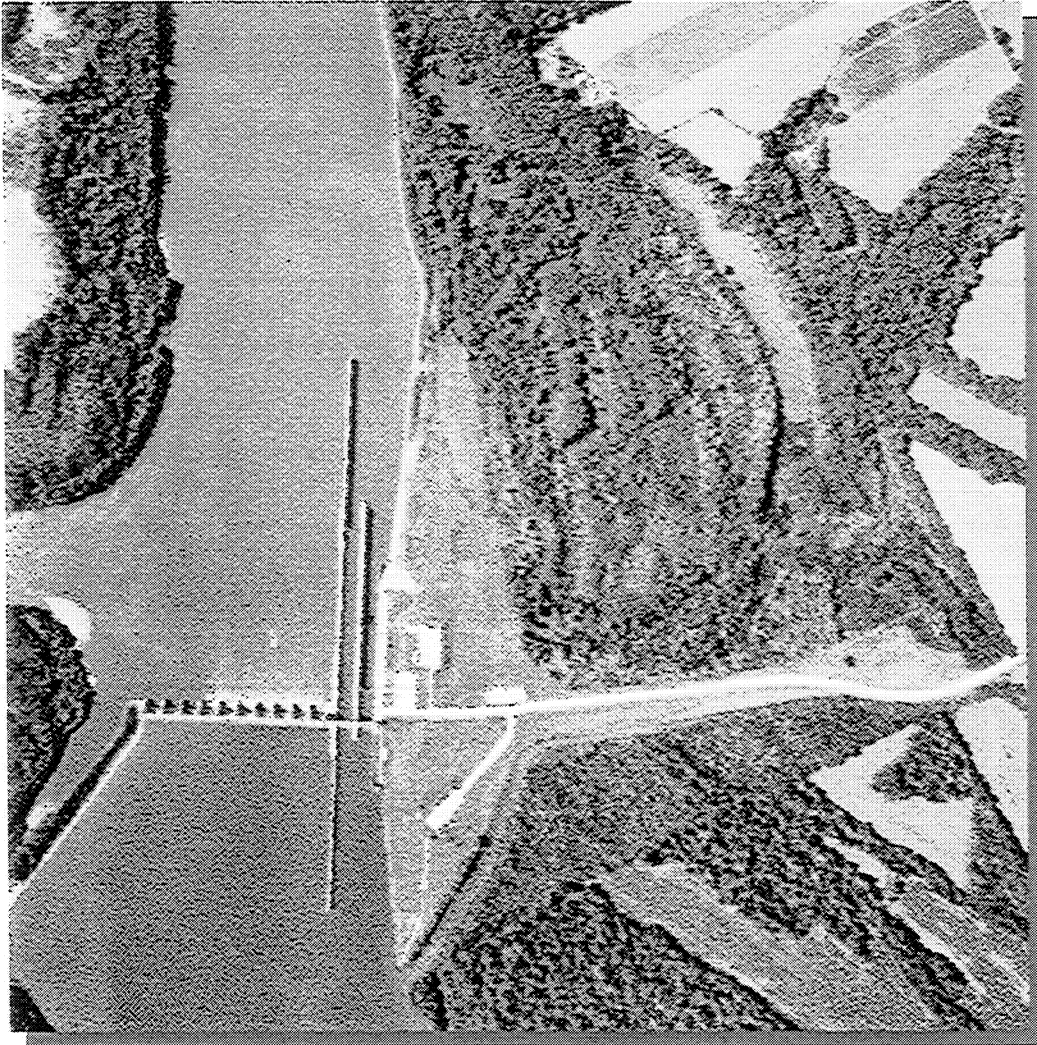


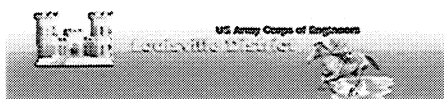
J.T. Myers Locks Improvements

Part A-3. Terrestrial Cover Types

TERRESTRIAL COVER TYPES AT J. T. MYERS LOCKS AND DAM A FIRST LOOK



Submitted to



Louisville, Kentucky

Submitted by



Baton Rouge, Louisiana

September 1998



September 1998

**TERRESTRIAL COVER TYPES
AT
J. T. MYERS LOCKS AND DAM
A FIRST LOOK**

Contract No. DACW27-97-D-0013
Delivery Order No. 0015
GEC Project No. 24321215

Submitted to

**U.S. Army Corps of Engineers
Louisville District
Louisville, Kentucky**

Submitted by

**G.E.C., Inc.
Baton Rouge, Louisiana**

Engineering • Economics • Transportation Technology • Social Analysis • Environmental Planning

P.O. Box 84010 • Baton Rouge, Louisiana 70884-4010 • (225) 612-3000 • Fax (225) 621-3016
9357 Interline Avenue • Baton Rouge, Louisiana 70809-1910

TABLE OF CONTENTS

<u>Topic</u>	<u>Page</u>
Introduction	1
Cover Types	5
Maple/Elm/Ash Forests	7
Stream/Lake/Ditch-Side Forest	9
Well-Drained Forest	11
Open Areas	13
Summary of Terrestrial Habitats	15
Future Cover Types	16
Other Considerations	18

LIST OF TABLES

Table 1. Species observed at J.T. Myers Locks and Dam Site	4
Table 2. General forest cover types found near the J.T. Myers Locks and Dam Site	5
Table 3. Cover types and acreage of each surveyed at the J.T. Myers Locks and Dam Site	15

LIST OF FIGURES

Figure 1. Location of J.T. Myers Locks and Dam	2
Figure 2. Property boundary of J.T. Myers Locks and Dam Site and extent surveyed	3
Figure 3. General categories of cover types found at J.T. Myers Locks and Dam Site	6
Figure 4. Maple elm/ash forest types delineated at J.T. Myers Locks and Dam Site	8
Figure 5. Forest types delineated along streams, lakes and ditches at J.T. Myers Locks and Dam Site	10
Figure 6. Well-drained forest stands delineated at J.T. Myers Locks and Dam Site	12
Figure 7. Open areas delineated at J.T. Myers Locks and Dam Site	14
Figure 8. General cover types as they may appear in year 2007	17

INTRODUCTION

J. T. Myers Locks and Dam impounds water for the purpose of providing a minimum navigation pool for commercial navigation traffic on the Ohio River. It is located at Ohio River Mile 814.0, approximately 10 air miles southwest of Mt. Vernon, IN (Figure 1).

Currently there are two locks of different lengths at this location. Two options are being considered to increase the capacity of the locks; either extend the shorter lock to increase its capacity, or build a third lock. Both options will require disposal of excavated material from the construction of the structures. However, construction of a third lock will require disposal of a much larger amount of soil which would be costly to haul off-site. The Louisville District of the U.S. Corps of Engineers owns approximately 583 acres at the J. T. Myers site that has been proposed as a disposal area, but impacts to the terrestrial habitats as a result of disposal of excavated material is unknown.

A first step in quantifying impacts is to survey the area and determine existing cover types and predict what cover types will be present at the time of construction (after year 2007). GEC was contracted to conduct a terrestrial habitat survey over a portion of the site (approximately 305.5 acres). Using real-time global positioning systems (GPS), aerial photography, and ground sample points along transects, GEC was able to map the cover types as they exist in 1998 and predict their status in year 2007 (Figure 2).

To clarify common names used in the discussion of cover types, a master list of plants and wildlife observed with scientific names is provided (Table 1). Wildlife species listed are limited to game species; in addition to those listed, numerous species of song birds, raptors and shorebirds were observed.

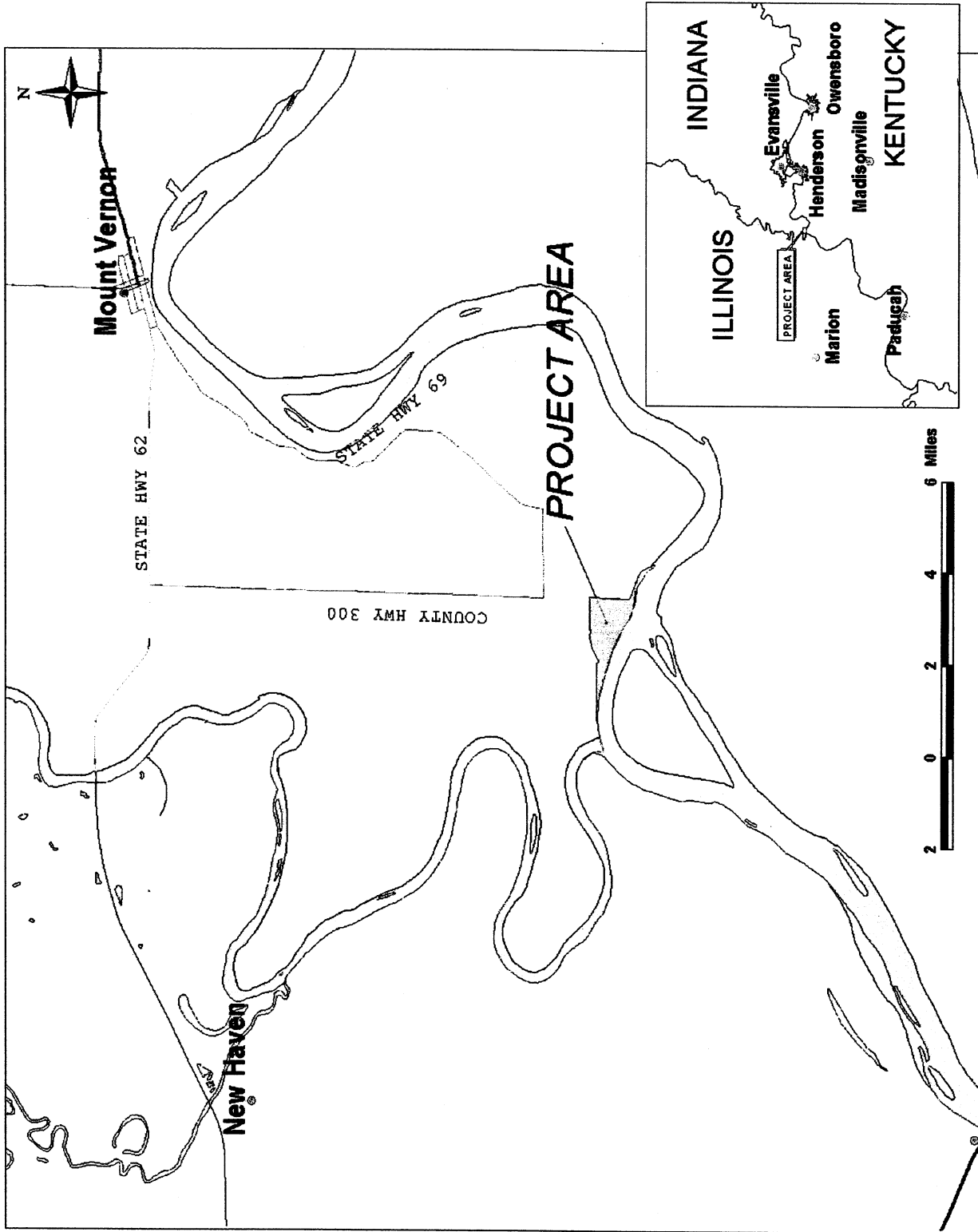


Figure 1. Location of J.T. Myers Locks and Dam

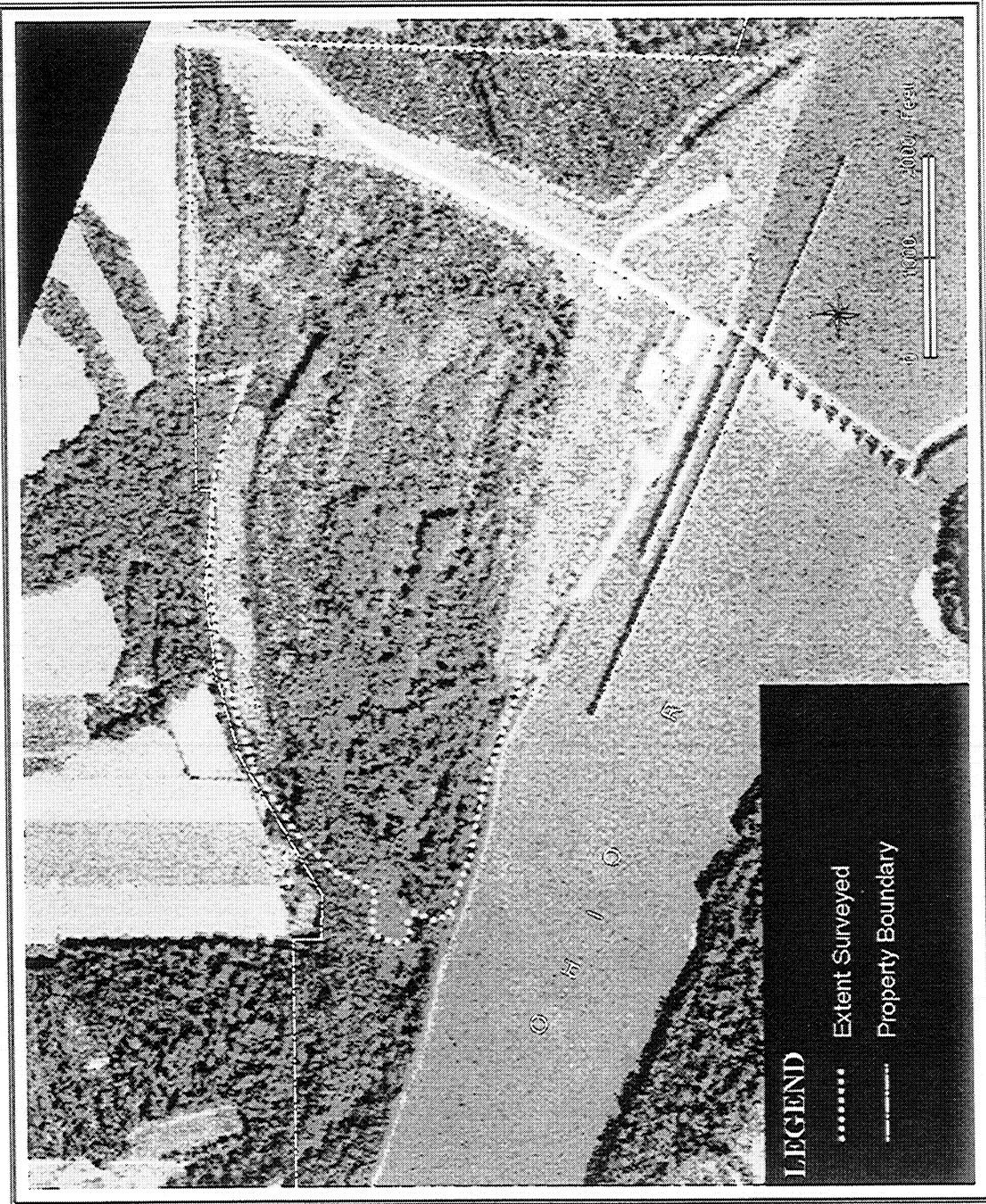


Figure 2. Property boundary of J.T. Myers Locks and Dam Site and extent surveyed

Table 1. Species Observed at J. T. Myers Lock and Dam

Plants

Boxelder	<i>Acer negundo</i>
Red maple	<i>Acer rubrum</i>
Swamp Red maple	<i>Acer rubrum drummondii</i>
Silver maple	<i>Acer Saccharinum</i>
Sugar maple	<i>Acer Saccharum</i>
Giant ragweed	<i>Ambrosia trifida</i>
Lead plant	<i>Amorpha fucicosa</i>
Big bluestem	<i>Andropogon gerardii</i>
Switchcane	<i>Arrundinaria gigantea</i>
Paw paw	<i>Asimina triloba</i>
Sweet pecan	<i>Carya illinoisensis</i>
Shellbark hickory	<i>Carya laciniosa</i>
Hackberry	<i>Celtis occidentalis</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Eastern redbud	<i>Cercis canadensis</i>
Flowering dogwood	<i>Cornus florida</i>
Hawthorn	<i>Crataegus sp.</i>
Persimmon	<i>Diospyros virginiana</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Honeylocust	<i>Gleditsia triacanthos</i>
Black walnut	<i>Juglans nigra</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Osage orange	<i>Maclura pomifera</i>
Blackgum	<i>Nyssa sylvatica</i>
American sycamore	<i>Platanus occidentalis</i>
Eastern cottonwood	<i>Populus deltoides</i>
Black cherry	<i>Prunus serotina</i>
Scarlet oak	<i>Quercus coccinea</i>
Overcup oak	<i>Quercus lyrata</i>
Pin oak	<i>Quercus palustris</i>
Cow oak	<i>Quercus prinus</i>
Black oak	<i>Quercus velutina</i>
Winged sumac	<i>Rhus copallina</i>
Poison ivy	<i>Rhus radicans</i>
Black locust	<i>Robina pseudoacacia</i>
Dewberry	<i>Rubus sp.</i>
Black willow	<i>Salix nigra</i>
Sassafras	<i>Sassafras albidum</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Greenbrier	<i>Smilax sp.</i>
Goldenrod	<i>Solidago sp.</i>
American elm	<i>Ulmus americana</i>
Ironweed	<i>Veronia sp.</i>
Muscadine	<i>Vitis rotundifolia</i>
Wildlife	
White-tailed deer	<i>Odocoileus virginianus</i>
Coyote	<i>Canis latrans</i>
Eastern fox squirrel	<i>Sciurus niger</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Wild turkey	<i>Melagris gallopavo</i>
Northern bobwhite	<i>Colinus virginianus</i>

COVER TYPES

According to *Forest Cover Types of the United States and Canada* (Society of American Foresters, 1980), the project area falls within the Oak-Gum-Cypress major forest type which extends up the lower Mississippi and Ohio River valleys. However, three other major cover types, Elm-Ash-Cottonwood, Maple-Beech-Birch, and Oak-Hickory converge near the project area and apparently influence the cover types on site. Based on field observations, the project area is best defined by subtypes of the later three. A list of major cover types and associated forest cover subtypes in the region is presented in Table 2.

Silver maple-American elm is a sub-type of the elm-ash-cottonwood forest region and is the most common cover type on the site. Its composition varies depending on the history of the stand, and on “washboard” swamps or “ridge and swale” complexes where high and low ground is intermingled, it has associated species very similar to those noted on site. The cottonwood subtype of the elm-ash-cottonwood forest region is apparent in some areas on site. However, this type is generally short-lived and succession to both silver maple-American elm and sycamore-sweetgum-American elm has already occurred over much of the site. Additionally, the sassafras-persimmon subtype of the oak-hickory forest region is found on some of the better drained areas, and the abundance of red maple in young pure stands on lower areas of the site is indicative of the red maple subtype of the maple-beech-birch forest region.

Table 2. General forest cover types found near the J.T. Myers Locks and Dam site.

<u>Major Forest Cover Type</u>	<u>Forest Cover Subtype</u>
Elm-Ash-Cottonwood	Silver Maple-American Elm Cottonwood Sycamore-Sweetgum-American Elm
Maple-Beech-Birch	Red Maple
Oak-Hickory	Sassafras-Persimmon

Although general site characterizations can be made by these textbook classifications, cover types were identified and classified on-site. The site was surveyed by walking transects to take sample plots and a combination of aerial photography and real-time GPS. Using a combination of these data, cover types were divided into homogenous areas based on species composition and age. These homogenous areas can be grouped into four categories: maple/elm/ash forests, well drained oak/hickory/persimmon forests, stream/lake/ditch-side forests, and open areas. These general categories are depicted in Figure 3.

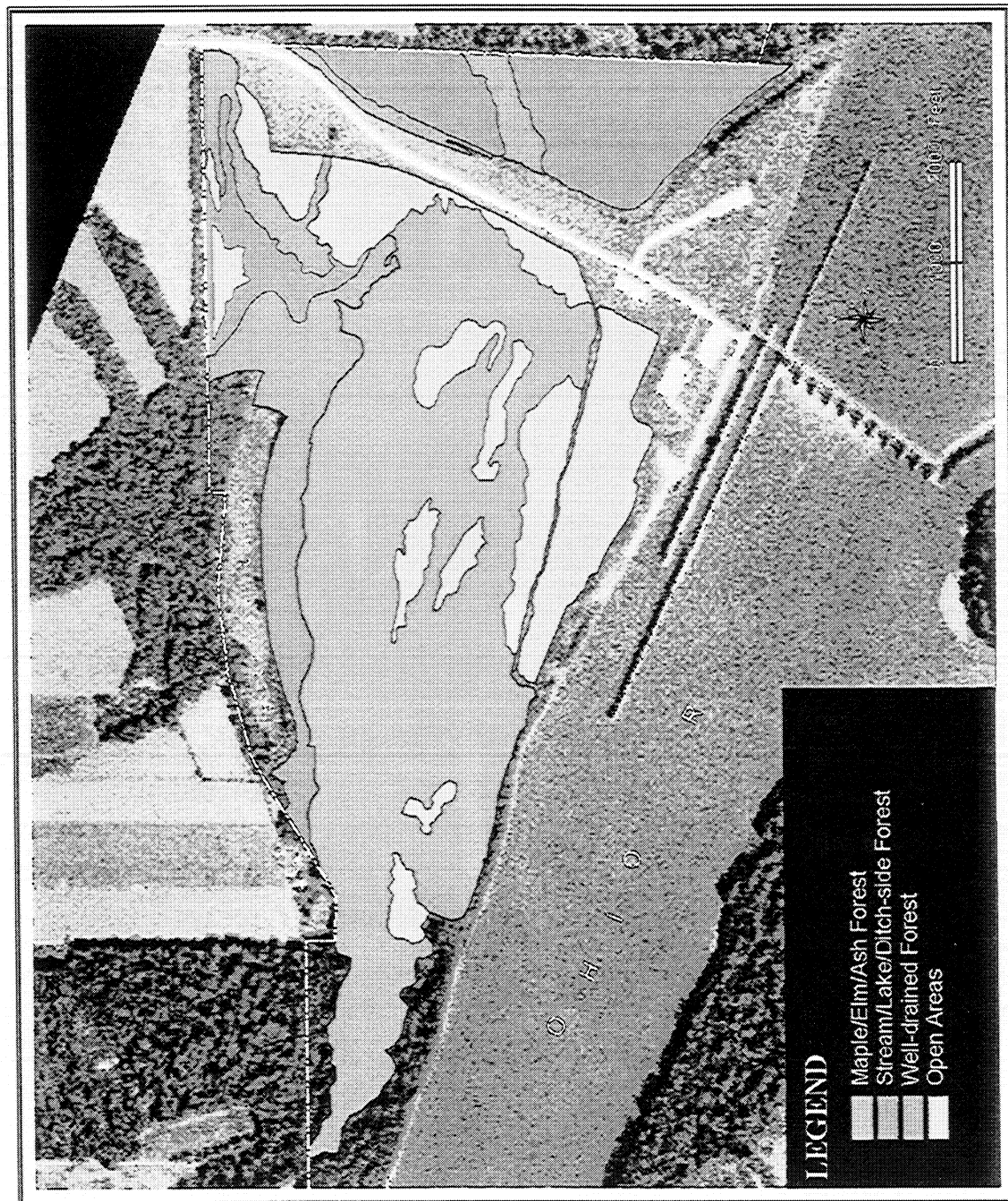


Figure 3. General categories of cover types found at J.T. Myers Locks and Dam Site

Maple/Elm/Ash Forests

The western portion of the study area is a forested wetland which transitions from the maintained land around the locks and dam down to Pitcher Lake. This area is largely comprised of maples, American elm and green ash with a high overstory of Eastern cottonwood in many areas. A combination of water regime and historic land use have influenced the species composition of this area. Forest stands range from pure maple to others with primarily American elm and green ash with various mixes throughout. Four types of maple/elm/ash forest were delineated (Figure 4) and are described below.

Red Maple Forest. Small stands of red maple are the most homogeneous and easily recognized stands in this area. The pure stands are dense and relatively young with almost no understory component due to frequency and duration of flooding and shade resulting from the closed canopy.

Maple/Cottonwood Flats. Large, frequently flooded flatwoods comprised of older maples and Eastern cottonwood dominating the overstory are found to the western side of the study area. Due to periodic inundation and a closed canopy, the mid and understory are largely absent. In disturbed areas, where large trees have been downed, small thickets of vines and saplings of green ash and American elm are present.

Maple/Cottonwood Ridge and Swale Complex. The least homogeneous type is defined by a large ridge and swale complex which produces a series of inundated and periodically flooded sites separated by a series of low ridges. The forest cover of this area is primarily comprised of maples, hackberry and green ash in the swales and Eastern cottonwood and some hickories on the ridges. The downslope (wetter) swales contain buttonbush and black willow, and upslope they transition into green ash and hackberry.

Maple/Ash/Elm Forest. To the south of the maple/cottonwood flats and ridge and swale complex are forests which receive less flooding and have a slightly different composition than adjacent forest stands. These areas have closed canopies of mixed species including maple, green ash and American elm with a varying Eastern cottonwood component. Due to the lower frequency and/or duration of flooding, the under and mid-story can be rather thick in some areas. In places with a higher density of maples, the understory is more open, and as the composition shifts to more American elm and ash, the mid and understory becomes thicker with some hackberry and boxelder present.

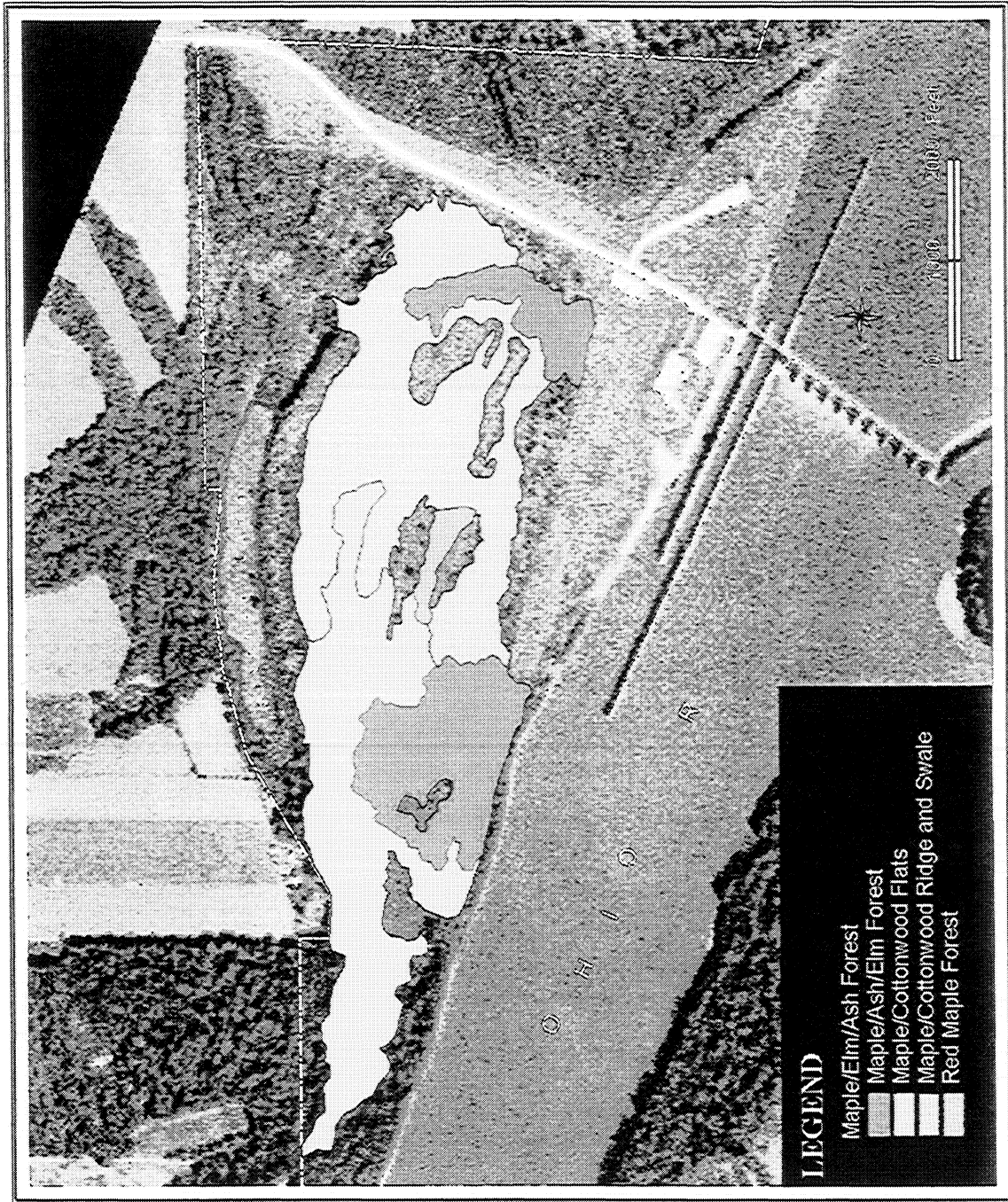


Figure 4. Maple elm/ash forest types delineated at J.T. Myers Locks and Dam Site

Stream/Lake/Ditch-Side Forest

The majority of the site is flooded in varying degrees at different times of the year. Depending on the duration of flooding and the slope of the land, the composition of these forested areas adjacent to streams and ditches can vary greatly. Three types of forests found along the margins of Pitcher Lake and natural streams and drainages (Figure 5) are described below.

Mature Forest. Three areas on-site are defined by larger trees along streams or natural drainages with adjacent sloping land. These areas contain more mature trees relative to surrounding land with very little under and mid-story due to inundation and the dense canopy. Patches of switchcane and herbaceous growth are found along some of the side slopes of the streams and drains. The older trees in the drains include large maples, green ash, hackberry, and American sycamore, and older trees above the normal channel include hickories, maples and honeylocust. The remaining mature forested areas adjacent to and above the stream bank which flood less have a mid- and understory of greenbrier, large muscadine vines, pawpaw and hawthorn indicating a more mature forest composition.

Invader Forest. Very wet areas which have been disturbed in association with ditch construction or maintenance are forested by young black willow, Eastern cottonwood and American sycamore. These areas are often flooded throughout the year and will eventually be taken over by other bottomland species as the invader species die out through succession.

Willow/Buttonbush Swamp. In areas that are inundated the majority of the year, black willow and buttonbush predominate. These areas are usually bordered by green ash and maples either on ridges or through a gradual rise in elevation. The overstory of many of these areas have some older Eastern cottonwood. South of Pitcher Lake, it appears that an overstory of Eastern cottonwood and maples has died off in the last few years, possibly due to an increased hydroperiod, as a result of a higher water level being maintained in the lake.



Figure 5. Forest types delineated along streams, lakes and ditches at J.T. Myers Locks and Dam Site

Well-Drained Forests

Areas of the site which do not receive flooding as regularly or for shorter duration have species compositions which are more varied than the flooded maple forests and in some areas resemble upland forests. Although these areas have been designated as well drained, some of these areas could possibly be wetlands. Three of these areas have been delineated (Figure 6) and are described below.

Mixed Hardwoods. The portion of the study area east of the locks and dam access road is drier than the areas to the west. This area drained by a ditch to the west and a natural drainage into the ditch. The area has a higher proportion of hard mast producers and other wildlife species such as oaks, persimmon, hickories, black walnut, and honeylocust. Large, mature trees border the Corps land to the east indicating the past cover type and the seed source for the present stand composition.

Young Hardwood Forest/Scrub. These areas which are adjacent to the mixed hardwoods, have the same basic species composition, but are noticeably younger than the adjacent mixed hardwoods. These areas, due to their age, are less dense than the adjacent forest and therefore the canopy is open in many areas allowing a thick understory of sumac, lead plant and various vines and herbaceous plants to grow. Other areas have a very tight spacing of young hardwoods yielding a thick stand of sapling to pole-sized trees.

Sloping Woods. On the northern portion of the site, there is a forest stand found on slopes between upland areas and the wooded swamps and drainages. This area has been delineated due to its differing species composition from other forested areas on-site. Although some large Eastern cottonwoods are dominate in the canopy, the majority of the species filling in the canopy are younger sweetgum, boxelder, redbud, and black cherry.

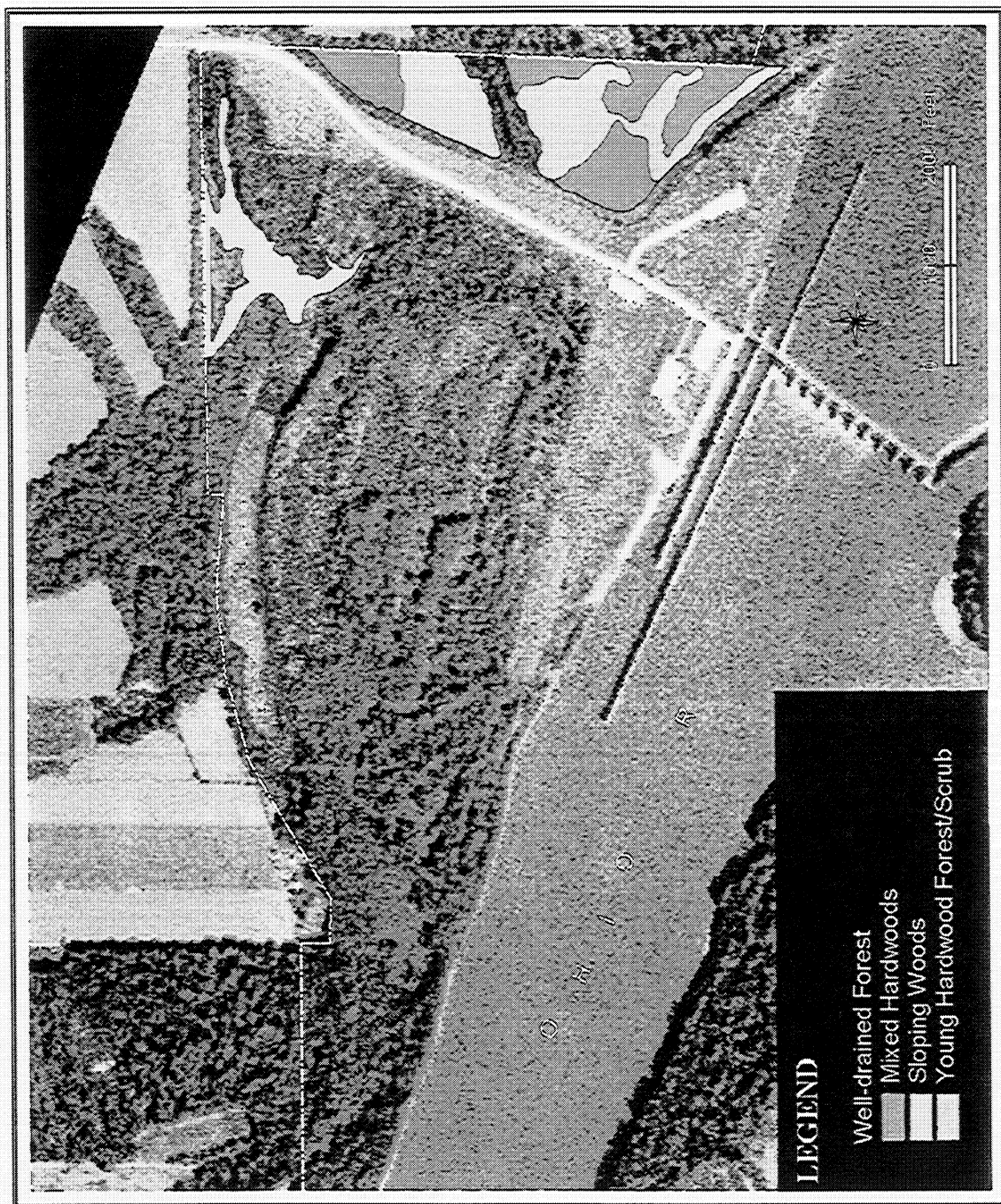


Figure 6. Well-drained forest stands delineated at J.T. Myers Locks and Dam Site

Open Areas

Around the locks and dam complex there are clearings maintained by periodic mowing which were not considered part of this study. Adjacent to these maintained clearings and within the maple/elm/ash forests are some open areas with different cover types (Figure 7). These are described below.

Prairie Restoration. This area has been planted as a restoration area by the Army Corps of Engineers. It is made up of a mixture of native prairie grasses and range plants. It is easily recognized by the presence of little and big bluestem as well as other annuals and perennials.

Young Hardwood Plantations. Some open areas have been planted with a mixture of native hardwoods such as oaks, hickories, dogwood, and green ash. These openings are covered in annuals and perennials, and the planted trees are primarily evident along the edges.

Herbaceous/Vine Covered. Some larger openings within the maple cover types were delineated due to their size. These were created by some disturbance as evident by the stumps, and downed debris from trees which must have been previously present. The openings are covered in vines such as morning glory or thick patches of giant ragweed or cocklebur. Some of these areas may have been planted in mixed hardwoods; however, either due to their small size or poor survival, the young trees are not evident at this time.

Ash/Maple Scrub. Wetter openings within the ridge/swale complex consist of sapling-sized green ash and maples in thickets of various annuals, perennials and vines. In areas where the saplings are larger, the understory thins out as the canopy closes.

Ash/Hackberry Scrub. Slightly drier openings along the maintained clearing and prairie areas are comprised of American elm, hackberry and green ash saplings with a dense understory of leadplant and various perennials and annuals. It appears that these areas may have been cleared for agricultural use prior to Corps ownership.

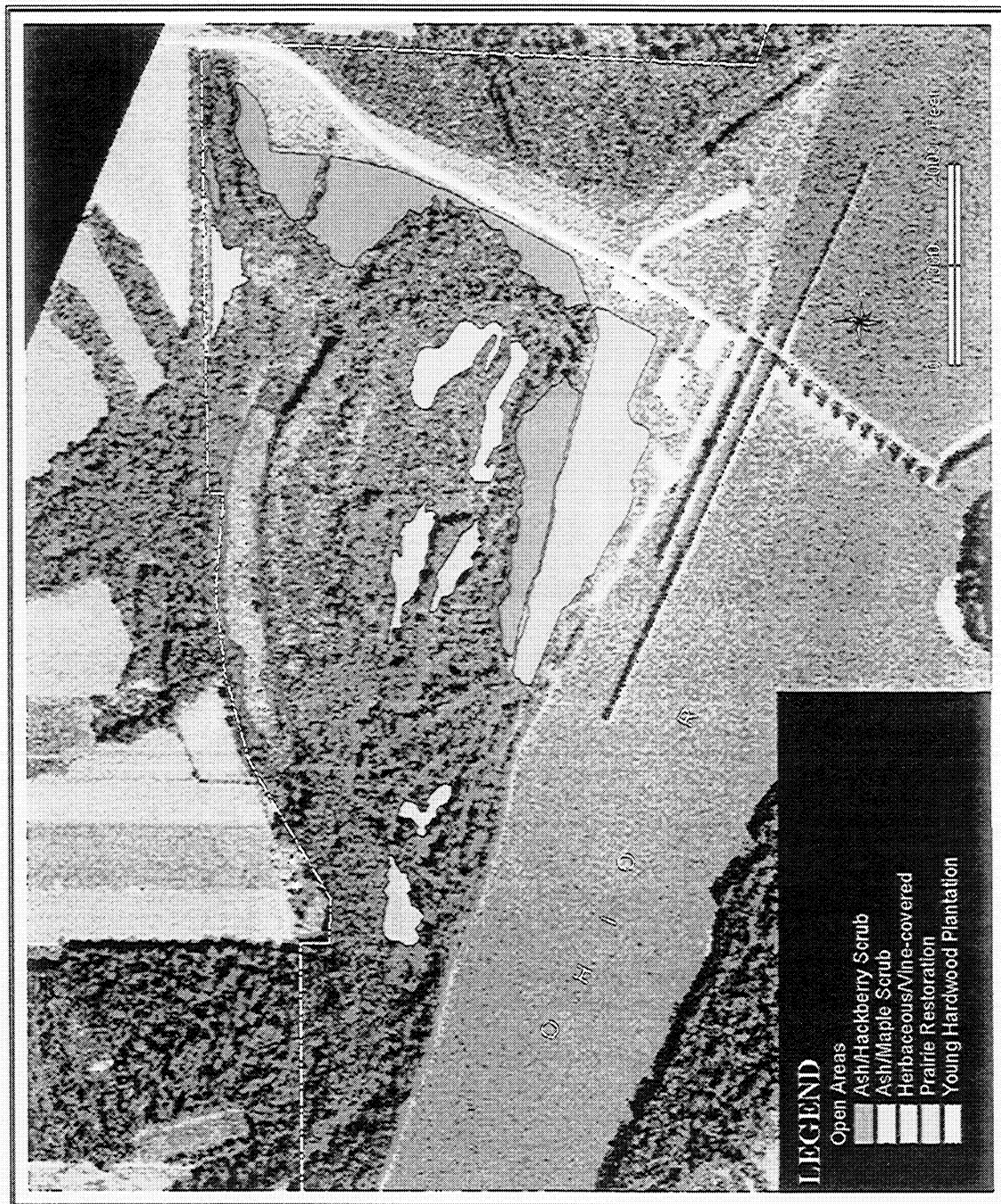


Figure 7. Open areas delineated at J.T. Myers Locks and Dam Site

SUMMARY OF TERRESTRIAL HABITATS

Many of the cover types described above may be considered redundant, and some types can be lumped together or grouped differently. If field observations confirmed an apparently different habitat that was discernable on the aerial photo, it was delineated and described. In some cases, such as the ridge and swale complex, differences were noted on the photo, but in the field it was too difficult to determine where one cover type started and the other terminated so they were combined. Table 3 presents acreage by cover type, grouped by general types.

Table 3. Cover types and acreage of each surveyed at the J. T. Myers Locks and Dam Site.

<u>Cover Type</u>	<u>Acreage</u>
Red Maple	2.7
Maple/Cottonwood Flat	47.3
Maple/Cottonwood Ridge and Swale Complex	67.9
Maple/Ash/Elm	33.2
MAPLE/ELM/ASH FORESTS TOTAL	151.2
Mature Forest	20.6
Invader Forest	5.0
Willow/Buttongbush Swamp	17.3
TOTAL STREAM/LAKE/DITCH-SIDE FOREST	42.8
Mixed Hardwoods	17.3
Young Hardwood forest/Scrub	20.0
Sloping Woods	9.7
TOTAL WELL-DRAINED FOREST	47.1
Prairie Restoration	20.4
Young Hardwood Plantations	2.2
Herbaceous/Vine Covered	8.3
Ash/Maple Scrub	6.6
Ash/Hackberry Scrub	26.9
TOTAL OPEN AREAS	64.4
TOTAL ALL AREAS SURVEYED	305.5 ac

FUTURE COVER TYPES

Over the majority of the site, species composition is expected to change little in the next nine years.

Figure 8 shows the general cover types as they may appear in nine years. Many subtypes may disappear as the general cover types become more homogeneous. Other cover types may take on subtle changes due to maturity.

Some change may be noticed in association with the large Eastern cottonwood which are slowly being naturally succeeded by maple and other mixed hardwood types. If the water level in Pitcher Lake is regulated by the control structure adjacent to the Ohio River, the woods south of the lake may further change in composition as evidenced by the Eastern cottonwoods and maples which have already died due to the change in hydrology associated with the control structure.

In relation to habitat type and quality, the maple, elm and green ash-dominated forests will not increase in quality to a great extent, unless the older trees begin to create gaps in the canopy resulting in some under and midstory cover. On the other hand, the mixed hardwood forests with mast-bearing species will increase in quality as the forests mature and diversify in the understory. Mast production will increase as these young hardwood stands mature, thus making them more valuable to wildlife. Subtypes in the maple/elm/ash and well drained forests will become more difficult to delineate as the forests become more homogeneous.

Open areas will mature over the next nine years; however, current species composition and neighboring stands will determine what will be present in the future. If not disturbed, the prairie restoration area will maintain its current composition. In the hardwood plantations, the surviving saplings should begin to show some dominance over the vines and herbaceous cover which currently dominate the young trees. The resulting low canopy should cause some of the dense cover to thin out. The herbaceous/vine covered openings which currently have few tree species should begin to show signs of being succeeded by woody shrubs and saplings of surrounding soft mast trees such as maples, hackberry, and American elm creating a young scrub cover. Young hard mast trees probably will not be found on these sites in nine years since the young scrub will be made up of surrounding species.

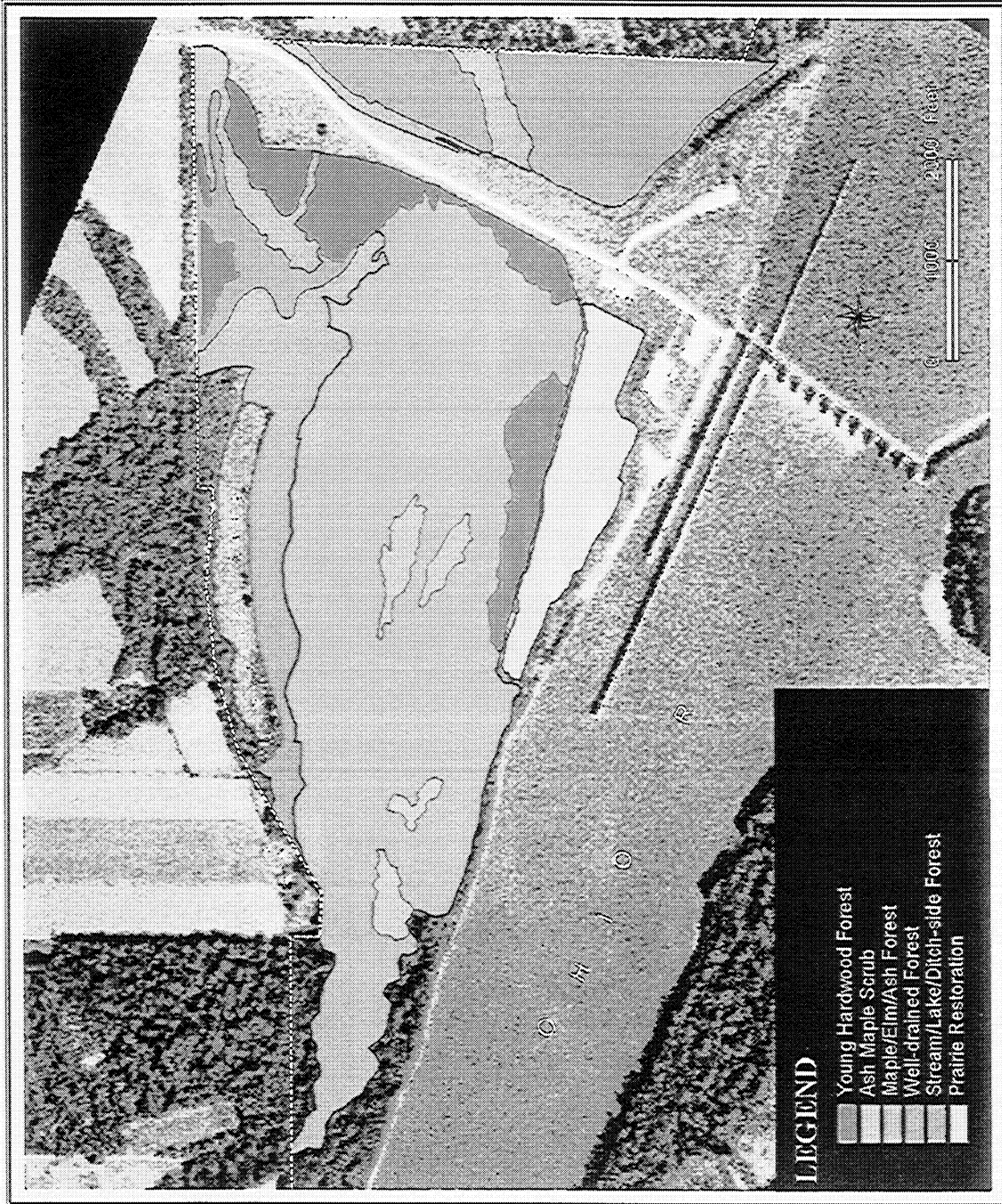


Figure 8. General cover types as they may appear in year 2007

The wetter openings which are surrounded by maples, elms, ash, and hackberry in the ridge and swale complex currently have a stand of saplings which will become more homogeneous with their surroundings. In nine years the primary difference will be the age and size difference.

In the scrub areas adjacent to the maintained clearings, tree species present such as green ash, American elm and hackberry will be maturing and beginning to form a closed canopy over parts of these areas. Where there is a lower density of trees present, younger soft mast trees will begin to establish themselves, but the area will continue to resemble a scrub/shrub cover type until there is a canopy. In nine years, portions of these areas should be a dense stand of pole and sapling-sized trees making up a young hardwood forest while other portions will be comprised of scrubby saplings and shrubs. Hard mast species are not likely to establish themselves in these areas in the next nine years.

Species composition, soil types and hydrology in the wetland areas are not expected to change in the span of nine years.

OTHER CONSIDERATIONS

Although there may not be a significant change in the next nine years, if the new lock were to be constructed and the soil were to be disposed of on-site, prior to the Federal action some detailed site-specific data would need to be collected and analyzed.

A terrestrial Habitat Evaluation Procedures (HEP) study of the specific areas to be disturbed may be warranted which would evaluate the habitats with and without project for the project life (usually 50 years). In year 2057, many of these areas will undergo significant change associated with maturation and succession and there will be a noticeable gain in habitat quality for terrestrial wildlife species over the project life. If any area were to be cleared, this would be interpreted as a loss of habitat that would need to be mitigated.

Additionally, in the NEPA process, impacts to protected species will be evaluated. One species in particular, the Indiana bat (*Myotis sodalis*) could be impacted by clearing of some of these areas. This species roosts and rears young under the bark of several tree species including shellbark hickory and older maples with rough, sloughing bark. Currently there are shellbark hickories in the well drained and

sloping forests which could possibly provide shelter for this bat, and in the future, the forests with a maple component could also provide habitat as they mature.

The majority of the site has been characterized a wetlands in this report. However, a wetland determination was not included as part of this habitat survey. After alternative locations for disposal sites are specified, a jurisdictional wetland delineation will be required to determine impacts to wetlands as a result of the action.